SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
B.Sc. END SEMESTER EXAMINATIONS APRIL-2022
SEMESTER - IV
20USTCT4007 - Statistical Inference - I

Total Duration : 3 Hrs. **Total Marks : 60**

Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Derive the invariance property of the consistent estimator.
2. State and prove the Rao-Blackwell theorem.
3. Explain the method of minimum Chi-square.
4. Describe the method of obtaining confidence intervals for proportions.
5. Explain the method of the goodness of fit.
6. Briefly explain the method of variance.
7. Prove that an M.V.U is unique in the sense that if T_1 and T_2 are M.V.U. estimators for $\gamma(\theta)$, then $T_1 = T_2$ almost surely.
8. Find the sufficient estimator for μ and σ^2 in the case of the normal population.

Section B

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. State and prove the Neyman factorization theorem.
10. State and prove Cramer Rao inequality.
11. For the double Poisson distribution:
    p(x)= P(X=x)= $\frac{1}{2}\frac{e^{-m_1}m_1^x}{x!} + \frac{1}{2}\frac{e^{-m_2}m_2^x}{x!}$; x=0,1,2,...
    Show that the estimators m_1 and m_2 by the method of moments are:
    $\mu_1' \pm \sqrt{\mu_2' - \mu_1' - {\mu_1'}^2}$
12. Obtain 100(1-α) % confidence intervals for the parameters of θ and σ^2, of the normal distribution.
13. How will you test the significance of mean in the case of single and difference of means.

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